Docket No.: D8888.0001
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Li Yadong

Application No.: 10/582,434

Confirmation No.: 4874

Filed: July 4, 2005

Art Unit: 3633

For: FRACTURE-PROOF FLAT CLASPING FLOORBOARD STRIP AND THE FLOORING ASSEMBLED WITH SUCH STRIPS

Examiner: J. T. Fonseca

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on August 9, 2010, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are paid concurrently herewith.

If this communication is filed after the shortened statutory time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 C.F.R. § 1.136(a), to extend the time for filing this Appeal Brief by the number of months which will avoid abandonment under 37 C.F.R. § 1.135. The fee under 37 C.F.R. § 1.17 should be charged to our Deposit Account No. 50-2215.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

I.	Real Party In Interest
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IV.	Status of Amendments
V.	Summary of Claimed Subject Matter
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VIII.	Claims
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I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Danyang Lanke Diamond Precision Tools, Ltd.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 2 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 3, 4 and 5

2. Claims withdrawn from consideration but not canceled: none

3. Claims pending: 1 and 2

4. Claims allowed: none

5. Claims rejected: 1 and 2

C. Claims On Appeal

The claims on appeal are claims 1 and 2

IV. STATUS OF AMENDMENTS

Appellant did not file an Amendment After Final Rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is the only independent claim. As shown below, each limitation is disclosed by at least the following citations to the specification and figures. Specification citations are provided in accordance with 37 C.F.R. § 41.37, such reference numerals and citations are merely examples of where support may be found in the specification. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification or the specific citations used. As demonstrated by the reference numerals and citations above, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. The reference numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

Claim 1:

A pair of fracture-proof flat clasping floorboard pieces, each floorboard piece having an elongated strip shape **[Fig. 2, B; p. 4, line 9]**;

a slot mortise formed along one of the long sides of each floorboard piece **[Fig. 2, 11; p. 4, lines 9-10]**,

a tenon provided along the other long side **[Fig. 2, 12; p. 4, lines 10-11]**;

an upper side wall of the slot mortise having a short end **[Fig. 2, 111; p. 4, lines 11-12]** and a lower side wall of the slot mortise having a long end **[Fig. 2, 112; p. 4, lines 11-12]**;

an upper surface **[Fig. 2, 113; p.4, lines 12-13]** of the slot mortise **[Fig. 2, 11]** being parallel to and having the same height with an upper surface **[Fig. 2, 121; p. 4, lines 12-13]** of the tenon **[Fig. 2, 12]**;

characterized in that a V-shaped groove **[Fig. 2, 115; p. 4, lines 13-14]** is provided in a lower surface **[Fig. 2, 114; p. 4, lines 13-14]** of the slot mortise **[Fig. 2, 11]** and a corresponding convexity **[Fig. 2, 123; p. 4, lines 14-15]** is provided on a lower surface **[Fig. 2, 122; p. 4, lines 13-14]** of the tenon **[Fig. 2, 12]**;

the convexity **[Fig. 2, 123]**, in an insertion direction of the tenon **[Fig. 2, 12]**, has an anti-self-locking oblique surface **[Fig. 2, 124; p. 4, lines 15-16]** formed on a front end thereof;

the anti-self-locking oblique surface **[Fig. 2, 124; p. 4, lines 15-16]** forms a first angle **[Fig. 2, α; p. 4, lines 16-17]** with an upper surface **[Fig. 2, P; p. 4, lines 16-17]** of the floorboard strip **[Fig. 2, B]**;

the first angle ranging from 15-35° **[Fig. 2, α; p. 4, lines 17-18]**;

a corresponding oblique surface **[Fig. 2, 116; p. 4, lines 18-19]** is formed on an external surface on the long end **[Fig. 2, 112; p. 4, lines 18-19]** of the lower side wall of the slot mortise **[Fig. 2, 11]** to engage with the anti-self-locking oblique surface **[Fig. 2, 124; p. 4, lines 18-19]** of another floorboard of the pair of floorboard pieces **[Figs. 2-3; p. 4, lines 18-19]**;

a rear end of the convexity **[Fig. 2, 125; p. 4, lines 19-21]** matches with an external side surface **[Fig. 2, 117; p. 4, lines 19-21]** of the V-shaped groove **[Fig. 2, 115; p. 4, lines 19-21]** of the another floorboard to form a self-locking surface **[Figs. 2-3; p. 4, line 21]**, which forms a second angle **[Fig. 2, β; p. 4, lines 22-23]** with the upper surface of the strip **[Fig. 2, P, p. 4, lines 22-23]**;

the second angle ranges from 30-70° **[Fig. 2, β, p. 4, line 23]**; and

the external shape of the tenon **[Fig. 2, 12; p. 4, lines 23-25]** corresponds with the shape of the slot mortise **[Figs. 2-3, 11; p. 4, lines 23-25]**,

wherein the upper surface **[Figs. 2 and 4, 113; p. 5, lines 16-21]** of the slot mortise **[Fig. 2, 11]** overlaps the upper surface **[Figs. 2 and 4, 121; p. 5, lines 16-21]** of the tenon **[Fig. 2, 12]** of

the another floorboard from 1-2 mm **[Figs. 2 and 4, 121; p. 5, lines 16-21]** prior to deflection of the lower surface **[Figs. 2 and 4, 114, 112; p. 5, lines 16-21]** of the slot mortise **[Fig. 2, 11]** and before the self-locking surface **[Figs. 2-3; p. 4, line 21]** is formed as the pair of floorboard pieces **[Figs. 2-4, B, B']** are attached horizontally relative to each other **[Figs. 2-4]**.

Claim 2:

The pair of fracture-proof flat clasping floorboard pieces as claimed in Claim 1, characterized in that the long end of the side wall **[Fig. 2, 112]** of the slot mortise **[Fig. 2, 11]** is 2-4mm longer **[Figs. 2-4; p. 4, lines 25-26]** than the short end **[Fig. 2, 111]**.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The rejection of claims 1 and 2 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,490,836 to Moriau et al.

VII. ARGUMENT

Appellant respectfully submits that claims 1 and 2 stand improperly rejected and, therefore, respectfully submits that the Board order the withdrawal of the outstanding rejection of these claims.

A. Claim 1

Among the limitations of independent claim 1 which are neither disclosed nor suggested in the prior art of record is a fracture-proof flat clasping floorboard piece wherein the anti-self-locking oblique surface forms a first angle ranging from 15-35° with an upper surface of the floorboard strip, and "the upper surface of the slot mortise overlaps the upper surface of the tenon of the another floorboard from 1-2 mm prior to deflection of the lower surface of the slot mortise and before the self-locking surface is formed as the pair of floorboard pieces are attached horizontally relative to each other."

The benefit to the use of a first angle in the range of 15-30° in combination with an overlap of the tenon and slot mortise of no less than 1-2 mm is that, among others, the floorboard pieces can be assembled horizontally (*i.e.*, they do not require rotation during assembly), the overall length of the tenon can be reduced, the overall depth of the slot mortise can be reduced, and the potential for breakage of the tenon and slot mortise during assembly can be reduced.

Each of these limitations is discussed below.

1. 1-2 mm Overlap Limitation

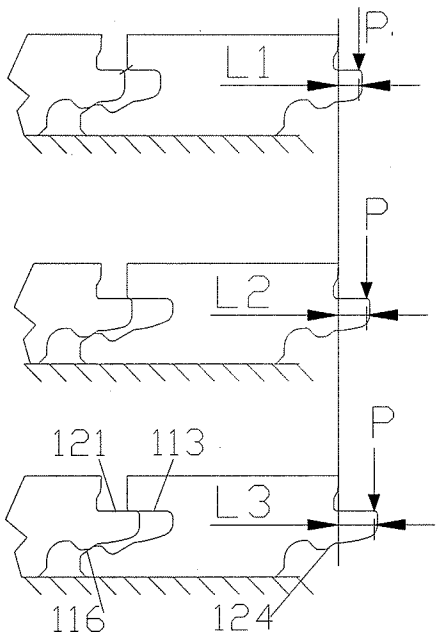
On pages 6-7 of the Office Action, the Examiner admits that Moriau et al. fails to disclose the claimed range of 1-2 mm overlap prior to deflection, but contends that such a range would have been obvious given the disclosure of Moriau et al. Appellant respectfully disagrees, and submits that the overlap range of 1-2mm is a critical to preventing floorboard breakage during horizontal assembly, and that Moriau et al. does not disclose or even suggest such an overlap range. Rather, as described in further detail below, Moriau et al. teaches that the lower portion of the mortise deflects prior to any overlap of the tenon and mortise when the Moriau et al. floorboards are assembled horizontally.

When floorboards are installed, the joints created must be tight and neat, and their longitudinal deformation, transverse deformation, height error, and joint gap need to meet corresponding manufacture and installation standards. If these standard requirements are not met, the floorboard will be considered a disqualified product. For example, if there is foreign matter between the tenon contact face and the slot mortise contact face, or local plastic deformation occurs during transport or installation, the tightness and neatness at floorboard joints will be directly affected, and cracks may occur in installed floorboard, thereby disqualifying the product.

Appellant has discovered that the tenon length has a direct effect on flexural stresses encountered when floorboard pieces are assembled horizontally. In floorboards, when the flexural stress is unchanged, the larger the length L, the smaller the pressure P. In other words, there is an inverse proportional relationship between the pressure P required to bend the floorboard tenon and

the tenon length L. Assuming the same floorboard material, the longer the tenon, the easier elastic deformation (bending) will occur. Thus, in floorboard structures that adopt a tenon-slot mortise engagement, the tenon structure of a smaller flexural strength is easier to guide into the slot mortise to achieve full engagement. The below Fig. A shows three different tenon lengths that were examined by Appellant; no overlap; less than 1-2mm overlap and 1-2mm overlap.

FIG. A



As shown in the below Figs. B1-B3, when there is no overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly, the floorboard is damaged during installation. Specifically, when assembled horizontally, the tenon moves along the slot mortise's beveled surface the front end of the tenon is pushed against the slot mortise (Fig. B2). If a horizontal force is continued to be applied, the front end of the tenon and the end of the slot mortise are damaged and the tenon cannot be guided into the slot mortise (Fig. B3). As such, correct installation of the floorboard cannot be accomplished when there is no overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly.

Fig. B1

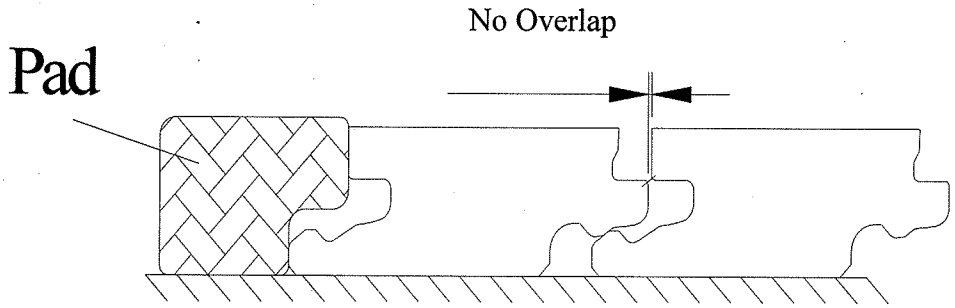


Fig. B2

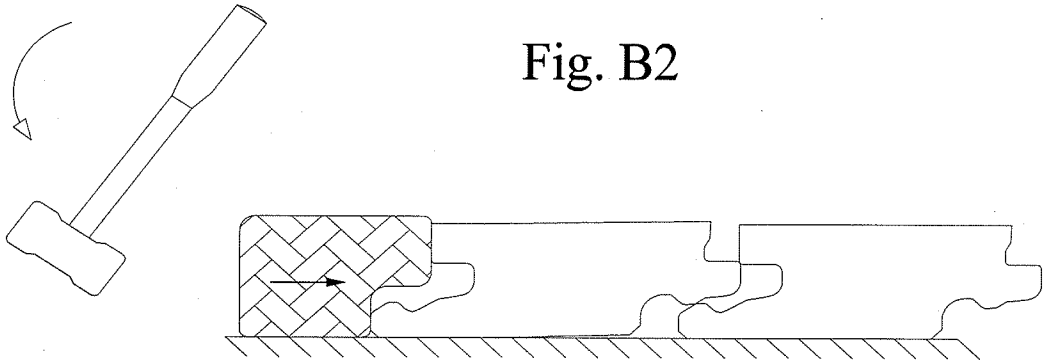
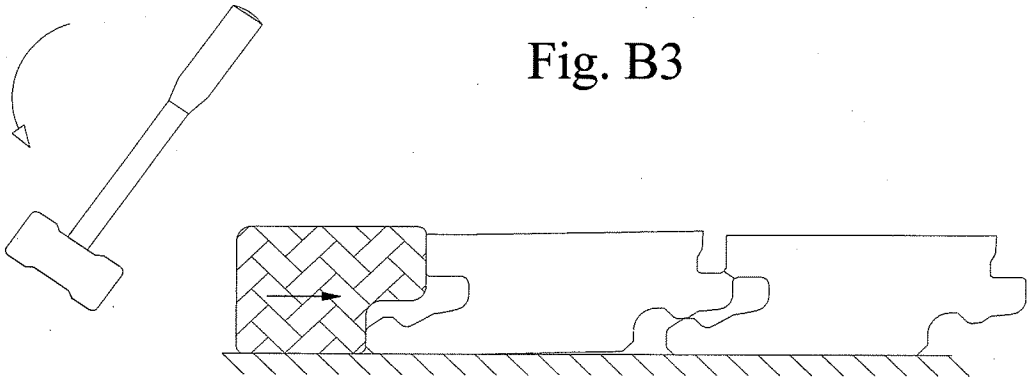


Fig. B3



As shown in the below Figs. C1-C3, when there is less than 1-2 mm overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly, the floorboard is damaged during installation. Specifically, when assembled horizontally, the tenon moves along the slot mortise's beveled surface contact area between the upper surface of the tenon and the upper surface of the slot mortise is small (Fig. C1). If a horizontal force is continued to be applied (Fig. C2), the small contact area will cause excessive local pressure to be applied, sharply increasing the friction resistance on the contact area, and thereafter causing local plastic deformation (damage), as shown in Fig.C3. In particular, the contact between surfaces 121 and 113 in Fig. C2 cause bulging deformation, which directly affects the tightness and neatness of the floorboard joints, and results in deformation and cracking at such joints. As such, correct installation of the floorboard cannot be accomplished when there is less than 1-2 mm overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly.

Fig. C1

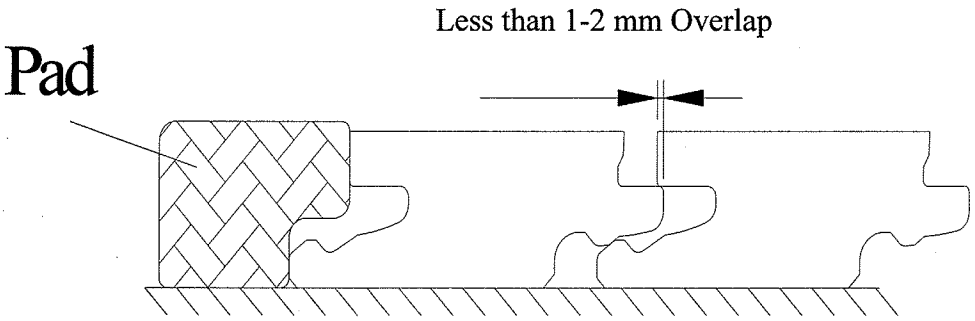


Fig. C2

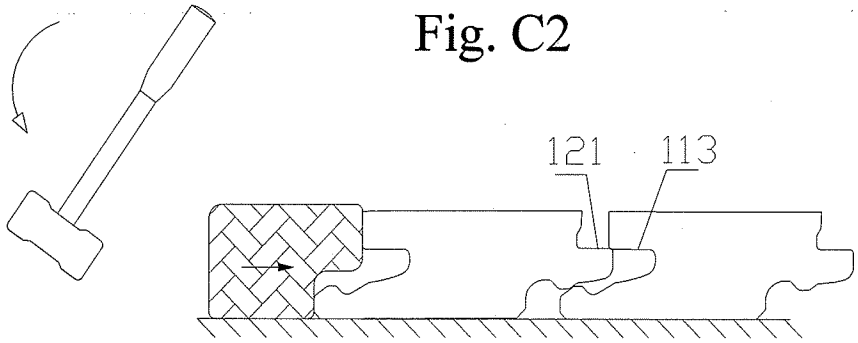
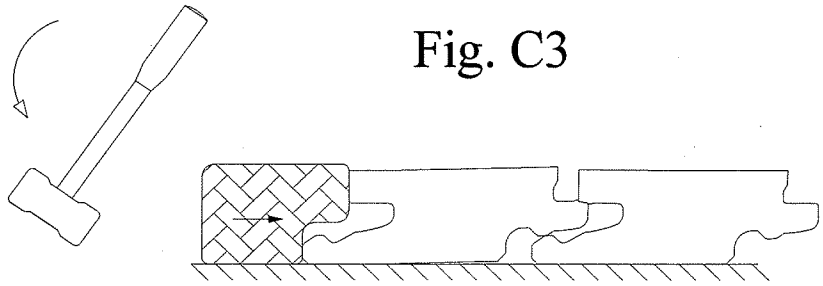


Fig. C3



Damaged Floorboard

However, as shown in the below Figs. D1-D3, when there from 1-2 mm in overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly, the floorboard is not damaged during installation. When assembled horizontally, the tenon moves along the slot mortise's bevel surface 116 and a pressing force is generated between plane 113 and plane 121 (Fig. D1). During the continued horizontal assembly, the tenon front end will be experience downward elastic bending deformation and the slot mortise will be subject to upward elastic bending deformation (Fig. D2). Specifically, during the process of the tenon being guided into the slot mortise, pressure generated on the tenon upper surface and the slot mortise upper surface acts on sufficiently large contact area, thereby dispersing the pressing force and avoiding excessive pressure and friction resistance. That is to say, no plastic deformation occur on the tenon and the slot mortise contact surfaces. As such, the tenon can be smoothly guided into position in the slot mortise after being subject to elastic deformation, and then restored to its original position (Fig. D3). Therefore, correct installation of the floorboard

is accomplished when there is from 1-2 mm overlap between the upper surfaces of the tenon and the slot mortise before deflection of the lower surface of the slot mortise during horizontal assembly.

Fig. D1

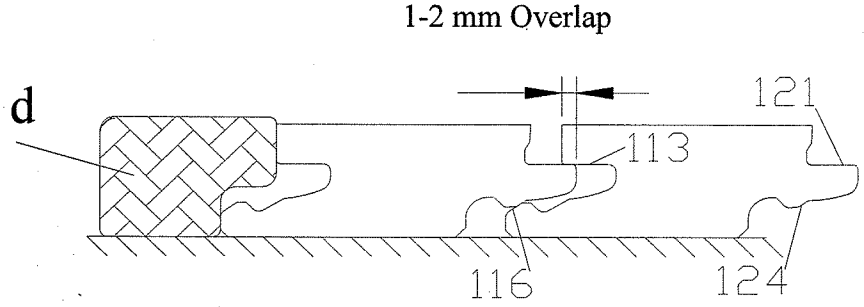


Fig. D2

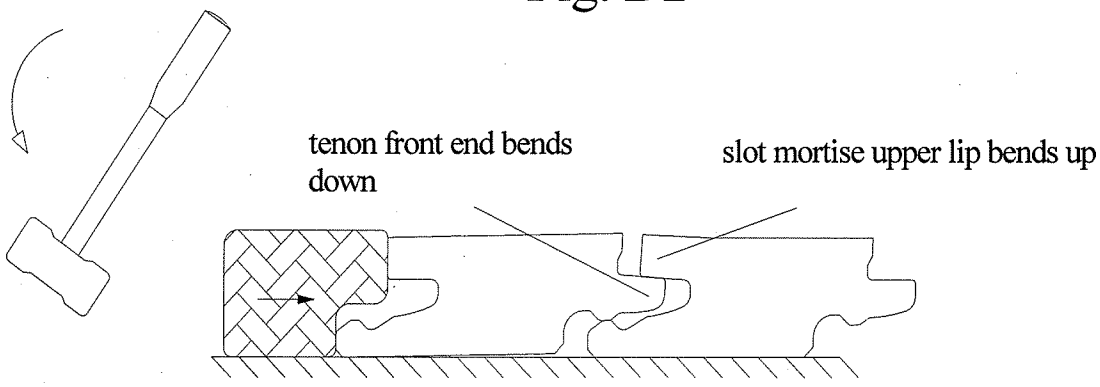
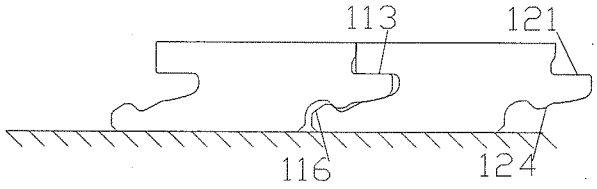


Fig. D3

Fig.4-4-3



Undamaged Floorboard

As discovered by the Appellant, and shown above, before deflection of the upper surface of the tenon, the tenon needs to be guided into the slot mortise by a depth of 1-2 mm during horizontal assembly so as to avoid damage to the floorboard and ensure a smooth installation.

Nowhere does Moriau et al. disclose or suggest that "the upper surface of the slot mortise overlaps the upper surface of the tenon of the another floorboard from 1-2 mm prior to deflection of the lower surface of the slot mortise and before the self-locking surface is formed as the pair of floorboard pieces are attached horizontally relative to each other" as required by independent claim 1.

A review of Fig. 25 of Moriau et al., and the corresponding description thereof in the specification, shows that Moriau et al. does not recognize that there is a correlation between the claimed overlap prior to deflection of the lower portion of the slot mortise and reduction of breakage of the floorboard. Specifically, it is unclear in Fig. 25 of Moriau et al. that there is any overlap between the tenon and slot mortise because Fig. 25 explicitly shows a first chain-dot line which appears to teach that there is no overlap between the tenon and upper portion of the slot mortise before deflection of the lower portion of the slot mortise. Moriau et al. simply does not recognize that an overlap range of 1-2 mm produces any particular result, let alone the result discovered by Appellant. Without such an indication, it would not be a matter of obvious design choice to modify Moriau et al. as contended by the Examiner. See MPEP §2144.05 II.B.

2. First Angle Between 15-35° Limitation

In contrast to the assertions by the Examiner, it is respectfully submitted that Moriau et al. does not teach or suggest the first angle required by independent claim 1. On page 3 of the final Office Action, the Examiner contends that one of skill in the art would have discovered the optimum or workable ranges of the having a first angle between 15-35° through routine experimentation based on the disclosure of Moriau et al. Appellant respectfully disagrees.

It is well established that a particular parameter must first be recognized as a result-effective variable, *i.e.*, a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also MPEP §2144.05.

There is simply no disclosure or suggestion in Moriau et al. that the angle of surface 76 in Figs. 22-25 with respect to the upper surface of the floorboard has any particular importance. As such, Moriau et al. does not even recognize that an angle between 15-35° for this surface is a result effective variable. In contrast, the present inventors have discovered through much experimentation, that the claimed first angle range provides superior functionality in assembly, stability and safety in an assembled floor. Since Moriau et al. does not recognize that the angle of surface 76 is a result effective variable, then the Examiner's conclusion of routine experimentation can not be supported. Accordingly, it is respectfully submitted that independent claim 1 is patentable for at least this reason.

In addition, Appellant respectfully submits that comparison by the Examiner of the angle A disclosed in Moriau et al. to ascertain the angle of surface 76 shown in Figs. 22-25 is improper because Moriau et al. does not disclose that the drawings are to scale.

When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "[I]t is well

established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue."). See also, MPEP §2125.

While Moriau et al. does disclose that angle A is between 30-70°, there is no mention in Moriau et al. as to what exact angle is used in Figs. 22-25 for surface 76. Without such a disclosure that the drawings are to scale, reliance on the drawings of Moriau et al. to teach a specific angle of surface 76 is improper. As such, it is improper for the Examiner to use the drawings of Moriau et al. to arrive at a conclusion that the invention defined in independent claim 1 is obvious. To do otherwise is impermissible hindsight reasoning.

Based on research of the Appellant, it was discovered that when the first included angle is equal to or larger than 15°, the tenon could be guided into the slot mortise by no less than 1-2 mm in advance of a full assembly position, and the length of the tenon and depth of the slot mortise could be shortened relative to the prior art floorboards. If the first included angle were less than 15°, the length of the tenon and depth of the slot mortise would both have to be increased. The resulting longer tenon and deeper slot mortise, such as that of Moriau et al., not only increases difficulty in manufacturing, but also accelerates wear on the manufacturing tools. Moreover, the larger dimensions of tenon and slot mortise result in a larger amount of excess floor material due to the greater amount of material needing to be removed to form the tenon and slot mortise.

Research of the Appellant has found that the upper limit of 35° of the first included angle defined in claim 1 also has significance. Appellant has found that this upper limit helps to ensure that during splicing of floorboard pieces, excessive external force is not required for assembly, thereby avoiding unnecessary damage to the tenon and slot mortise. Appellant has found that if this angle exceeds 35°, excessive external force may be required and damage to the tenon and slot mortise may occur.

Moriau et al. simply does not recognize the optimal angle of 15-35° specifically set forth in independent claim 1. This is because, as shown in Fig. 24 and described at col. 11, lines 5-28 of

Moriau et al., it is preferred that the floor panels of Moriau et al. are assembled with rotational movement so as to eliminate the need for a tool during assembly. While Moriau et al. does describe that the floor panels can be assembled in a lateral movement, such an assembly of the floor panels of Moriau et al. causes a significant deflection of the lower portion of the mortise as shown by the dot-dash line in Fig. 25, thereby increasing the amount of stress on the floor panels during installation, and increasing the possibility of breakage.

Therefore, it would not have been obvious to one of ordinary skill in the art to modify the Moriau et al. floor panel to have the surface 76 at an angle of 15-35° but for Appellant's disclosure of this optimal range. Accordingly, it is respectfully submitted that independent claim 1 is patentable for at least this reason as well.

B. Claim 2

Claim 2 depends directly from independent claim 1 and includes all of the limitations found therein, as well as additional limitations which, in combination with the limitations of claim 1, are neither disclosed nor suggested in the art of record.

On page 5 of the final Office Action, the Examiner admits that Moriau et al. does not disclose or suggest that the long end side wall is 2-4 mm longer than the short end wall. Similar to the reasoning throughout the final Office Action, the Examiner simply makes an unsupported conclusion that it would be obvious to modify the proportions of the floorboard of Moriau et al. to have the claimed range, contending that there would be no unpredictable results.

However, the Examiner has not first identified that Moriau et al. recognizes that making the long end of the side wall of the slot mortise 2-4 mm longer than the short end produces any particular result. This is because Moriau et al. has no such disclosure. Without such an indication, it would not be a matter of obvious design choice to modify Moriau et al. as suggested by the Examiner. See MPEP §2144.05 II.B. Accordingly, Appellant respectfully submits that claim 2 patentably distinguishes over the art of record.

C. Conclusion

For the reasons discussed above, Appellant respectfully request that the Board order the withdrawal of the rejection of pending claims 1 and 2.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A include the amendments filed by Appellant on March 29, 2010.

Dated: September 16, 2010

Respectfully submitted,

Electronic signature: /Richard LaCava/
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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/582,434

1. A pair of fracture-proof flat clasping floorboard pieces, each floorboard piece having an elongated strip shape; a slot mortise formed along one of the long sides of each floorboard piece, a tenon provided along the other long side; an upper side wall of the slot mortise having a short end and a lower side wall of the slot mortise having a long end; an upper surface of the slot mortise being parallel to and having the same height with an upper surface of the tenon; characterized in that a V-shaped groove is provided in a lower surface of the slot mortise and a corresponding convexity is provided on a lower surface of the tenon; the convexity, in an insertion direction of the tenon, has an anti-self-locking oblique surface formed on a front end thereof; the anti-self-locking oblique surface forms a first angle with an upper surface of the floorboard strip; the first angle ranging from 15-35°; a corresponding oblique surface is formed on an external surface on the long end of the lower side wall of the slot mortise to engage with the anti-self-locking oblique surface of another floorboard of the pair of floorboard pieces; a rear end of the convexity matches with an external side surface of the V-shaped groove of the another floorboard to form a self-locking surface, which forms a second angle with the upper surface of the strip; the second angle ranges from 30-70°; and the external shape of the tenon corresponds with the shape of the slot mortise,

wherein the upper surface of the slot mortise overlaps the upper surface of the tenon of the another floorboard from 1-2 mm prior to deflection of the lower surface of the slot mortise and before the self-locking surface is formed as the pair of floorboard pieces are attached horizontally relative to each other.

2. The pair of fracture-proof flat clasping floorboard pieces as claimed in Claim 1, characterized in that the long end of the side wall of the slot mortise is 2-4mm longer than the short end.

APPENDIX B - EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C – RELATED PROCEEDINGS

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.